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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/069,183

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Takehiko Kitamori

2002-0252A

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10/05/2006

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EXAMINER

FINEMAN, LEE A

ART UNIT

PAPER NUMBER

2872

DATE MAILED: 10/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/069,183

Applicant(s)

KITAMORI ET AL.

Examiner

Lee Fineman

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 July 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 14-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 14-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 2/22/02 & 3/8/05 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

This Office Action is in response to an amendment filed 24 July 2006 in which claim 14 was amended. Claims 14-17 are pending.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 14 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Opsal, US 5,074,669 in view of Hiraga et al., WO99/08149, Eguchi et al., US 5,402,407, and Power, US 5,365,065 or Prekel et al. US 5,760,400.

Regarding claim 14, Opsal discloses in fig. 1 a desktop thermal lens microscope apparatus, comprising a laser (20) forming an excitation light source operable to emit excitation light; a chopper (24) positioned to modulate the excitation light when emitted from said excitation light source (fig. 1); a beam expander (26) that enables collimation adjustment in a direction of a light path of the excitation light (fig. 1); another laser (60) forming a probe light source operable to emit probe light; a collimator lens (in 64) positioned to emit the probe light as parallel light-ray beams when the probe light is emitted from said probe light source (fig. 1); a microscope optical system (36, 40, 50, 52, 54) operable to receive the modulated excitation light and receive the probe light as a parallel light beam (from 64), said microscope optical system comprising an objective lens system (40) and having a stage (50, 52, 54) for receiving a

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specimen (42) thereon, wherein the modulated excitation light and the probe light can be passed through said objective lens system and into said stage such that a thermal lens is formed by irradiation of the excitation light into the specimen on said stage (fig. 1 and column 5, lines 19-21), wherein said beam expander is adjustable in position (in so far as it can be moved at least in the assembly of the device) such that the probe light that has passed through the thermal lens can be diffused so as to be focused on an optical axis of the modulated excitation light around the thermal axis (fig. 1, in so far as a.] inherently the creation of the thermal lens causes some light to scatter/diffuse and b.] when the thermal lens is generated by the focusing of the excitation beam onto the sample, the optical axis of the thermal lens (at 42) and the optical axis of the probe light must inherently overlap along the optical path of the probe beam to be able to detect the emitted probe light with the photodetector, i.e., if the probe light did not overlap with the optical axis of the thermal lens than the probe light could not be detected since it would be traveling in a different direction); and a light receiving system (66, 84, 80) positioned to receive the modulated excitation light and the probe light that has passed through the thermal lens (fig. 1). Opsal discloses the claimed invention except for the lasers being semiconductor lasers; and a single housing, wherein said excitation light source, said probe light source, said chopper, said beam expander, said collimator lens, said microscope optical system and said light receiving system are integrated together in said single housing. Opsal is also silent to said beam expander enabling biaxial centering in a direction perpendicular to the excitation light path. Hiraga et al. teach a thermal lens microscope system (fig. 1) which includes a probe laser (2) and an excitation laser (1) and further teach that gas lasers, solid-state lasers, dye lasers and semiconductor lasers are art-recognized equivalents for providing a light source (page 25, lines 11-24, see English

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11-24, see English Translation in US 6452710, column 17, lines 44-48). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use any of the above lasers including semiconductor lasers as claimed in the system of Opsal as reliable, commonly available light source for the system. Secondly, thermal lens systems that are integrated into a single housing, i.e. connected together by means of a structure, are very well known in the art for providing a more stable system which prevents accidental misalignment of the elements. For example, Power or Prekel et al. both teach thermal lens systems that integrate light sources choppers, beam expanders, lenses and light receiving systems (fig. 1, Power and fig. 2, Prekel). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to integrate all the elements of Opsal in view of Hiraga et al. as set forth above to provide a more stable system which prevents accidental misalignment of the elements. Finally, Eguchi et al. teach an optical system (see figs. 2 and 5) which include a beam expander that enables biaxial centering (column 6, lines 63-66, via x-axis and z-axis adjustment) in a direction perpendicular to the excitation light path (fig. 5). It would have been obvious to one of ordinary skill in the art at the time the invention was made to the beam expander of Opsal have biaxial centering as suggested by Eguchi et al. to provide for easy ancillary adjustment of the beam without further complicating the structure (Eguchi, column 2, lines 44-46).

Regarding claim 16, Opsal further discloses a method for performing a chemical analysis, comprising performing a chemical analysis (column 7, lines 23-44) of a very small quantity in a micro spatial region on a chip (42).

3. Claims 15 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Opsal in view of Hiraga et al., Eguchi et al., and Power or Prekel et al., as applied to claims 14 and 16 above, and further in view of Morris et al., US 4,591,272.

Opsal in view of Hiraga et al., Eguchi et al., and Power or Prekel et al., as applied to claims 14 and 16 above disclose the claimed invention except for explicitly stating that said chopper is operable to perform lock-in amplifier signal processing with a modulation mechanism that performs phase-locked loop (PLL) control of the drive of the chopper and thereby performs modulation of the excitation light. Morris et al. teach disclose a desktop thermal lens microscope apparatus (fig. 1) including a chopper (24) that is operable to perform lock-in amplifier signal processing with a modulation mechanism (not shown) that performs PLL control of the drive of the chopper and thereby performs modulation of the excitation light (column 4, lines 18-25 and lines 49-51). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the chopper of Opsal in view of Hiraga et al., Eguchi et al., and Power or Prekel et al. perform lock-in amplifier signal processing and PLL control as suggested by Morris et al. to provide more effective modulation control.

Response to Arguments

4. Applicant's arguments filed 24 July 2006 have been fully considered but they are not persuasive.

Applicant argues that Opsal does not disclose that the probe light has passed through the thermal lens can be diffused so as to be focused on an optical axis of the modulated excitation light around the thermal lens by adjusting the position of the beam expander (see remarks, page

5, paragraph 6). The examiner respectfully disagrees. The position of the beam expander, which has at least been adjusted in assembly to provide the appropriate collimation, is focused on the optical axis of the modulated excitation light around the thermal lens (see fig. 1 - when the thermal lens is generated by the focusing of the excitation beam onto the sample, the optical axis of the thermal lens (at 42) and the optical axis of the probe light must inherently overlap along the optical path of the probe beam to be able to detect the emitted probe light with the photodetector, i.e. if the probe light did not overlap with the optical axis of the thermal lens than the probe light could not be detected since it would be traveling in a different direction) and the probe light will be diffuse as inherently the creation of the thermal lens causes some light to scatter/diffuse.

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lee Fineman whose telephone number is (571) 272-2313. The examiner can normally be reached on Monday - Friday 7:30 - 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on (571) 272-2312. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


LAR

21 September 2006


MARK A. ROBINSON
PRIMARY EXAMINER